

# **REQUEST FOR INFORMATION - NASA OFFICE OF THE CHIEF TECHNOLOGIST EARLY STAGE INNOVATION DIVISION - NASA INNOVATIVE ADVANCED CONCEPTS PROGRAM**

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## **General Information**

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Response Date:	Sep 12, 2010
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Internet Address:	<a href="http://prod.nais.nasa.gov/cgi-bin/eps/bizops.cgi?gr=D&amp;pin=04#143325">http://prod.nais.nasa.gov/cgi- bin/eps/bizops.cgi?gr=D&amp;pin=04#143325</a>

## **Office Address**

NASA/Goddard Space Flight Center, NASA Headquarters Acquisition Branch, Code 210.H, Greenbelt, MD 20771

## **Description**

In Fiscal Year 2011, NASA plans to begin the NASA Innovative Advanced Concepts (NIAC) Program. The Office of the Chief Technologist is fostering the development of innovative, low Technology Readiness Level (TRL) concepts to accelerate the development of transformational capabilities and “push” technologies. NIAC will fund early studies of visionary concepts that could dramatically improve aerospace missions 10 or more years in the future.

To support program formulation, the NASA Office of the Chief Technologist (OCT) is seeking input on the NIAC plans described in this document and suggestions for revolutionary aerospace concepts or topic areas that NASA should consider.

NIAC is part of OCT’s Early Stage Innovation (ESI) Division. ESI efforts are expected to

be short term – typically one year in duration – to mature concepts and technologies that could significantly enhance various missions, or enable NASA to pursue entirely new missions. These OCT efforts will complement the NASA Mission Directorates’ focused technology activities, which directly support their planned missions. While the Mission Directorate efforts typically begin at TRL 3 or higher, this program will target...

- TRL 1 (basic principles observed and reported),
- TRL 2 (technology concept and/or application formulated), or
- early TRL 3 (analytical and experimental critical function and/or characteristic proof of concept)

at the beginning of the selected effort. The full TRL scale and associated definitions are provided in the Appendix.

Through this sustained, deliberate investment in a low TRL portfolio, NASA is seeking:

- Revolutionary concepts and technologies that will greatly advance NASA’s missions
- Ideas that may result in beneficial changes to NASA’s long-range plans
- Cross-cutting technologies that contribute new technological approaches for aerospace applications and, ideally, also fulfill national needs in areas such as communications, power, energy storage, propulsion, safety, and security.

Several external and NASA-sponsored studies in the past decade have identified key technology advances that would benefit potential future missions:

- FINAL REPORT of the Review of U.S. Human Space Flight Plans Committee, October 22, 2009, [http://legislative.nasa.gov/396093main\\_HSF\\_Cmte\\_FinalReport.pdf](http://legislative.nasa.gov/396093main_HSF_Cmte_FinalReport.pdf) .
- A Constrained Space Exploration Technology Program: A Review of NASA's Exploration Technology Development Program, 2008, [http://www.nap.edu/catalog.php?record\\_id=12471](http://www.nap.edu/catalog.php?record_id=12471) .
- Report of the President's Commission on Implementation of United States Space Exploration Policy, 2004, <http://www.haydenplanetarium.org/tyson/media/pdf/MoonToMarsFinalReport.pdf> .
- Stepping Stone to the Future of Space Exploration: A Workshop Report, 2004, [http://www.nap.edu/catalog.php?record\\_id=11020](http://www.nap.edu/catalog.php?record_id=11020) .
- The 2004/2005 Advanced Planning and Integration Office (APIO) Technology Capability Portfolios: [http://mediaman.gsfc.nasa.gov/NASA\\_Tech\\_Strategies/APIO\\_Tech\\_Portfolios\\_2005/APIO\\_Tech\\_Portfolios\\_2005.htm](http://mediaman.gsfc.nasa.gov/NASA_Tech_Strategies/APIO_Tech_Portfolios_2005/APIO_Tech_Portfolios_2005.htm) .
- The 2003/2004 NASA Capability Requirements Analysis and Integration (CRAI) process to turn broad NASA objectives into capability and technology investment

strategies:

[http://mediaman.gsfc.nasa.gov/NASA\\_Tech\\_Strategies/CRAI\\_Tech\\_Reports\\_2004/CRAI\\_Tech\\_Reports\\_2004.htm](http://mediaman.gsfc.nasa.gov/NASA_Tech_Strategies/CRAI_Tech_Reports_2004/CRAI_Tech_Reports_2004.htm) .

- The 1999-2002 NASA Decadal Planning Team and NASA Exploration Team:  
[http://mediaman.gsfc.nasa.gov/NASA\\_Tech\\_Strategies/DPT\\_Summary\\_Reports/DPT\\_Summary\\_Reports.htm](http://mediaman.gsfc.nasa.gov/NASA_Tech_Strategies/DPT_Summary_Reports/DPT_Summary_Reports.htm)

This list of references may be considered a starting point for the topics to be considered, and is not intended to be comprehensive.

In the spirit of the original NASA Institute for Advanced Concepts, the reinstated NIAC will invite innovative yet technically credible advanced concepts that could one day change the possible in aeronautics and space.

#### Planned Approach and Typical Awards

NIAC will support innovative research through two phases of study. It is expected that the Phase I awards will be \$100K for a one-year effort to explore the overall viability and advance the TRL of a visionary concept.

It is expected that NIAC Phase II awards will be \$500K for up to two years, to further develop the most promising concepts and explore potential infusion options, both within and outside of NASA. Phase II awards will be competitively selected from proposals based on successful NIAC Phase I studies (past or present).

It is NASA's intent to share all knowledge developed under this program, and public dissemination of results will be required.

Awards are expected to be in the form of grants, cooperative agreements, contracts, or intra-agency transfers, depending on the nature of the submitting organization and proposed effort.

#### Planned Eligibility Requirements

The goal of NIAC is to give visionary ideas a chance. NASA recognizes that concepts to transform the future may come from innovators across the nation, so the Phase I competition will be open to everyone. Prospective investigators from any educational institution, private or public company, organization, Federally Funded Research and Development Center (FFRDC) or NASA Center (including the Jet Propulsion Laboratory) are welcome to respond to this solicitation. Partnerships are welcome. Teaming with non-U.S. organizations in proposed efforts is also permitted, but subject to NASA's policy of no exchange of funds.

#### Proposal Details

The science/technical/management section of each proposal will be limited to 8 pages in length. A Work Plan delineating how the Recipient/Awardee will accomplish the Goals and Objectives of the proposal shall be included as part of the proposal. The Work Plan will be evaluated in accordance with the planned evaluation criteria (below).

#### Planned Evaluation Criteria

The following criteria (listed in descending order of importance) are planned:

- Potential Impact (Value) – If successful, the proposed activities must increase the technology readiness level (TRL) to enable new approaches or entirely new missions.

The following items will be considered:

- Innovation: Is this a truly visionary aerospace architecture, system, or mission concept? Does it have the potential to significantly enhance NASA opportunities or create revolutionary capabilities, approximately 10 or more years in the future?

- Comparative Benefit: In comparison with existing alternatives, does the proposed approach have clear potential to enable radical improvement in terms of higher performance, lower cost, less mass, higher reliability, improved safety, operational simplicity, ease of manufacturing, or other figures of merit for spaceflight hardware and missions?

- Maturation: Is the expected outcome of the proposed research an appropriate concept analysis, with a clear path for further development and utilization? Are potential partnerships and business cases being identified?

- Technical Merit and Work Plan – Evaluation of the overall technical merit of the proposal. The following items will be considered:

- Is there a rigorous description of the underlying scientific principles? The concept must be technically substantiated to be considered.

- Does the proposal present a sound technical approach to accomplish the proposed research objectives?

- Is the proposed effort feasible and planned with an appropriate schedule?

- Is the proposed study consistent with the TRL requirements in the solicitation?

- Suitability of Team and Cost Estimate – The following items will be considered:

- Does the proposed study include a team with sufficient technical knowledge and the facilities for successful completion of this project?

- Is the proposed budget sufficient to carry out the effort?

Both Phase I and Phase II competitions will be based on independent peer review of all qualified proposals.

#### Anticipated Schedule

The typical NIAC solicitation schedule is expected to be as follows:

T: Solicitation Released

T + 1 month: (Optional) Notices of Intent Due

T + 2 months: Proposals Due

T + 4 months: Selections Announced

T + 5.5 months: Awards in Place (Funded)

Each year, NASA plans to issue one call for NIAC Phase I studies, leading to approximately 16 awards. Starting in 2012, NASA anticipates adding a separate NIAC Phase II call as well, ramping up to about 3-8 new Phase II studies per year.

#### Additional Information

The information provided above was presented, in abbreviated form, at the OCT Industry Forum on July 13-15. The NIAC presentation, and other OCT information, may be accessed from the following site:

[http://www.nasa.gov/offices/oct/industry\\_day\\_info.html](http://www.nasa.gov/offices/oct/industry_day_info.html)

#### Instructions to Responders

This is not a request for proposal, quotation, or invitation for bid notice and is intended for information and planning purposes only. NASA does not intend to make any awards on the basis of this RFI. However, NASA may consider issuing a formal solicitation at a later date. NASA will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that NASA is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. NASA may contact respondents to this RFI if clarifications or additional information is desired. Responses to this RFI do not bind NASA to any further actions related to this topic. Any future steps taken to award Broad Agency Announcements (BAAs), NASA Research Announcements (NRAs), Request for Proposals (RFPs) or Space Act Agreements (SAAs) will be contingent upon Congressional approval and availability of funds.

This announcement contains all information required to submit a response. No additional

forms, kits, or other materials are needed.

NASA appreciates responses from all capable and qualified sources including, but not limited to, NASA Centers, universities, university affiliated research centers, federally-funded research and development centers, private or public companies, and government research laboratories.

Oral communications are not acceptable in response to this notice.

NASA will not consider material that is marked classified or proprietary. NASA reserves the right to use responses to develop future solicitations and other types of public correspondence. However, NASA does not intend to release any individual RFI responses.

Submissions must be 2 pages or less, using 12 pt font, in either portable document format (.pdf) or Microsoft Word (.doc).

RFI responses are asked to address any of the following areas:

- Do you have any comments for NASA consideration? Would you suggest any changes to improve the NIAC plans described above?
- What revolutionary aerospace concepts or topic areas do you think NASA should consider in NIAC? A brief description of your recommendations with accompanying rationale would be most helpful.

NOTE: Responses may be submitted as attachments to an email addressed to [hq-niac@mail.nasa.gov](mailto:hq-niac@mail.nasa.gov) no later than 11:59 PM Eastern on September 12, 2010.

Questions about this RFI may be directed to:

## **Point of Contact**

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